

Wells (Ed. F.)

PNEUMONIC FEVER—

ITS MORTALITY. WITH A CONSIDERATION
OF SOME OF THE ELEMENTS
OF PROGNOSIS.

BY
EDWARD F. WELLS, M.D.,
OF CHICAGO, ILL.

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PNEUMONIC FEVER—ITS MORTALITY. WITH A CONSIDERATION OF SOME OF THE ELEMENTS OF PROGNOSIS.

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The death-rate of pneumonic fever varies, according to the statements of authors, from *nil* to 100 per cent. I have collected and tabulated the statistics of 223,730 cases of this disease, of which number 40,276 perished from the direct effects of the malady—a rate of 18.1 per cent. These cases have been drawn from every available source, from all parts of the world, and have been subjected to every imaginable mode of treatment. Numerous schools of medical philosophy, and eras of fashion in therapeutics, have also passed through the various stages of their existence during the period of time covered by this inquiry. Notwithstanding this, it will be noticed that the death-rate of all the larger collections of cases—with few exceptions—is nearly the same, although they were probably subjected to widely different, possibly diametrically opposite, methods of therapeusis. From this we may infer that treatment alone has exercised but little influence over the natural course of the malady, and that the results of this analysis fairly represent its normal fatality. In addition, we have an indirect mortality of about 1.3 per cent. from cases followed by dependent chronic ailments, which, added to that from the disease *per se*, raises the true mortality rate to about 19.4 per cent.



Before giving the table, we will pass in review the published opinions of a few authorities on this subject: Bennett¹ considers the mortality of uncomplicated cases, properly treated, as being practically *nil*, and this opinion is shared by Barthez,² Joly,³ Palmer,⁴ Paton,⁵ Thomas⁶ and others. Ziemssen⁷ says that "according to his observation, primary croupous pneumonia in children almost always ends in recovery." Raven⁸ says that it "ends satisfactorily in a large majority of instances—children scarcely ever die of it." Trousseau⁹ says that "generally speaking, there is a tendency to spontaneous recovery," and similar words are used by Baginsky,¹⁰ Flint,¹¹ Waters¹² and many others.¹³ D'Espine,¹⁴ Hartshorn,¹⁵ Wood,¹⁶ and numerous other writers,¹⁷ consider the fatality as very light. Gerhard¹⁸ and others¹⁹ affirm that the death-rate in private practice should not exceed 2 or 3 per cent.

We hear much of the innocuity of simple pneumonic fever, and in the fatal cases, how frequently do we find death attributed to "complications." As a matter of fact, cases are continually finding their way in significantly large numbers to the post-mortem table, with no other lesions except those legitimately belonging to the disease, showing that the malady *is* dangerous.

Copland,²⁰ Drake,²¹ Mann²² and others²³ consider pneumonic fever a very fatal disease. Gross²⁴ says that it is one of the "most formidable maladies which the physician has to cope with, and forms one of the great sources of mortality." Loomis²⁵ says that "the mortality average from all the published reports to which he has had access, gives 20.1 per cent. of deaths. . . From such facts it must be admitted that a disease in which death occurs in one out of five cases, should be classed among the very fatal diseases." Drummond²⁵ looks "upon pneumonia as one of the most fatal of acute diseases."

Donaldson,²⁶ Hart,²⁷ Sturges²⁸ and others, think that the mortality has greatly decreased in recent years, whilst Hartshorn²⁹ and others³⁰ hold the opinion that it has greatly increased. The statistics presented in the following table will show that neither of these propositions are established by the facts in the case.

TABLE I.—SHOWING DEATH RATE OF PNEUMONIC FEVER.

OBSERVER AND REFERENCE.	Cases.	Deaths	Per Cent
Acerbi, Annot. di Med. Prac., Milano, 1819, p. 94 . . .	142	16	11.2
Antoniu, Inaug. Dissert., Bucharest, 1887 . . .	142	2	1.4
Armstrong, U. S. Marine Hosp. Rpts., 1886, p. 129 . . .	36	11	30.6
Baginsky, Pneumonie u. Pleuritis, Würzb., 1880 . . .	199	49	24.6
Bamberger, Wiener med. Wochenschr., 1857, Nr. 5 . . .	60	4	6.7
Bang, Ranking's Abst., No. 28, p. 92 . . .	54	2	4.0
Banks, U. S. Marine Hosp. Rpts., 1888, p. 226.	3,011	496	16.0
Bartels, Ann. d. Charité, Bd. vii, S. 234 . . .	161	21	19.4
Barthez, Bull. de l'Acad. de méd., 1862, T. xxvii, p. 676.	212	2	1.0
Basel Hospit., Berichte . . .	922	213	23.1
Bauer, Berichte med. Klin. München, 1878 . . .	109	21	19.1
Baumgärtner, Lungenentzündung, Stuttg., 1850 . . .	30	3	10.0
Becquerel, Sur l'influence des emiss. du sang, Paris, 1838 . . .	28	23	82.0
Bell, Braithwaite's Retrospect, Jan., 1859, p. 71 . . .	36	0	0.0
Bell, Ranking's Abst., No. 28, p. 92 . . .	81	4	5.0
Bennett, Lancet, 1865, Vol. 1, p. 195.	129	4	3.1
Berliner Charité, Annalen, 1876-7 . . .	567	116	19.8
Besnier, Quoted by Lépine, Pneumonie, Wien, 1883. . .	2,109	759	36.0
Biermer, Quoted by Kocher, Pneumonie, Würzb., 1866	60	10	16.6
Bird, Bouchet's Dis. Chest., London, 1865, p. 320 . . .	20	0	0.0
Bleuler, Inaug. Dissert., Zürich, 1865 . . .	228	44	19.3
Borland, Boston City Hosp. Rpts., 1870 . . .	190	27	14.2
Bouillaud, Dic. de méd., Paris, 1835 . . .	173	21	12.1
Bouillaud, Quoted by Sturges, Pneumonia, p. 206 . . .	102	12	12.0
Brandes, Virchow's Archiv., Bd. xv, S. 210 . . .	142	30	21.1
Brenchley, Lancet, 1890, Vol. I, p. 1425 . . .	12	0	0.0
Briquet, Ranking's Abst., No. 28, p. 92.	129	17	13.2
British Army, LaRoche, Pneumonia, Phila., 1854, p. 417	5,685	399	7.0
Burkard, Ranking's Abst., No. 28, p. 92.	120	2	1.6
Caton, Lancet, 1884, Vol. II, pp. 135-137 . . .	129	39	30.0
Chatelain, Jour. de méd. de Brux., 1870 . . .	39	20	52.0
Chomel, Pneumonie, Leipzig, 1841, S. 305 . . .	383	60	15.7
Churton, Lancet, 1890, Vol. II, p. 133 . . .	127	19	15.0
Chvostek, Cesterr. Zeitschr. f. prak. Heilk., 1867, Nr. 26, S. 43 . . .	209	36	17.2
Cincinnati Bd. Health Rpts., 1873-74-75 . . .	260	50	19.2
Cincinnati Hosp. Rpts., 1874-75 . . .	124	41	33.0
Cohn, Ranking's Abst., No. 28, p. 92 . . .	57	24	42.0
Coleman, Inaug. Dissert., Würzb., 1886, S. 13 . . .	25	3	12.0
Colin, Etudes clin. de méd. mil., Paris, 1863 . . .	74	4	5.2
Collective Investigation Record, London, 1884, Vol. II	1,065	192	18.0
Colles, U. S. Naval Rpts., 1881, p. 414 . . .	517	116	22.4
Cook Co. Hosp., Rpt. first half 1890, p. 36 . . .	134	49	14.4
Couldrey, Lancet, 1888 . . .	10	1	10.0

OBSERVER AND REFERENCE.	Cases.	Deaths	Per Cent
Croce, Deutsches Arch. f. klin. Med., Bd. xxxviii, S. 554	610	98	16.0
Dalton, St. Louis Med. Rev., Mar. 30, 1889, p. 355	124	45	36.3
Davis, Cincin. Lancet and Clinic, July 5, 1890, p. 9	15	1	6.6
De Bordes, Nederl. Weekbl. voor Genes., Jan., 1855	90	19	21.0
Derpmann, Inaug. Dissert., Bonn, 1885, S. 19	655	117	17.9
Dessau, Jour. Am. Med. Assoc., Nov. 29, 1890, p. 791	45	0	0.0
Dietl, Wiener med. Wochenschr., 1852	750	69	9.1
Dietl, Ranking's Abst., No. 28, p. 92	1,130	122	11.0
Doubleday, N. Y. Med. Rec., Mar. 28, 1885, p. 343	252	112	44.4
Dutcher, Cin. Lancet and Obsv., Jan., 1861, p. 10	50	1	2.0
Edinburg Infirmary Rpts., 1839 and 1865	80	4	5.0
Emmerich, Arch. f. Hygien., 1884, Bd. ii, Heft. 1	161	46	28.6
Feldhausen, Inaug. Dissert., Göttingen, 1879, S. 15	56	7	12.5
Fenwick, Lancet, Jan. 31 and Feb. 7, 1891	990	233	23.5
Fleandt, Helsingfors Duodecim, 1889	106	3	2.8
Fisher, N. Y. Med. Rec., July 28, 1889, p. 94	26	1	4.0
Fismer, Deutsches Arch. f. k. Med., Bd. xi, 1873	145	13	9.0
Fleischmann, Quoted by Sturges, Op. cit., p. 329	239	14	5.8
Flint, N. Y. Med. Jour., Mar., 1875, p. 290	133	35	26.3
Folkmann, Inaug. Dissert., Erlangen, 1847, S. 39	125	26	20.8
Forget, Gaz. méd. de Strasb., 1860	32	7	2.0
Fox, Reynolds' Syst. Med., Phila., 1880, Vol. II, p. 204	55	8	14.5
Franque, Statistik d. Pneumonie, Würzb., 1855	872	262	30.0
Fricke, Inaug. Dissert., Göttingen, 1886, S. 26	179	16	9.0
Frohmüller, Deutsche Klinik, 1855	12	0	0.0
Funck, Inaug. Dissert., Griefswald, 1868	941	102	10.8
Gandini, Ranking's Abst., No. 28, p. 92	25	0	0.0
Gentile, Laennec's Dis. Chest, N. Y., 1830, p. 270	40	1	2.5
Gerhard, Am. Jour. Med. Sci., Vol. XIV, p. 328	41	1	2.5
German Army, Hermann, Lungenentzündung, 1880	42,467	1,524	3.6
Green, N. Y. Med. Rec., July 20, 1889, p. 66	23	1	4.4
Grisolle, Traité de la Pneumonie, Paris, 1864	748	183	24.4
Gualdi, Lancet, 1884, Vol. II, p. 27	39	2	5.1
Hartshorn, Med. News, April 7, 1888	11,175	1,117	10.0
Hegele, Kissel's Pneumonie, Eilenburg, 1852, S. 149	40	0	0.0
Helbing, Canstatt's Jahresb., 1850	62	5	8.0
Hellis, Clin. méd., Paris, 1824	831	173	22.0
Herard, L'Union méd., 1847, No. 127	40	8	20.0
Hermann, Lungenentzündung, München, 1880, S. 13u.42	712	45	6.5
Hjaltelin, Edinb. Med. and Surg. Jour., April, 1864	80	3	3.7
Holt, N. Y. Med. Rec., Feb. 14, 1885, and April 7, 1888	198	37	19.0
Homburger, Inaug. Dissert., Strassb., 1879, S. 71-72	25	9	36.0
Hourmann et Dechambre, Arch. gén. de méd., 1836	109	76	70.0
Hulava, Deutsch med. Zeitung, 1855	12	0	0.0
Huss, Lungenentzündung, Leipzig, 1861, S. 94	2,710	375	13.9
Jackson, N. Y. Med. Jour., March, 1875, p. 290	51	8	15.0
Jones, Jour. Am. Med. Assoc., Aug. 7, 1886, p. 144	238	16	6.5
Judrin, Thèse de Paris, 1824, p. 17	30	1	3.3
Juergehen, Croup, Pneumonie, u. s. w., Tüb.	567	73	12.7
Kieman, Präger, Vierteljahrshr., 1867, Bd. xcix	40	5	12.5
Kierchensteiner, Aerztl. Intelligenzb., 1880	160	46	28.7
Kissel, Canstatt's Jahresb., 1852	112	5	4.5
Kissel, Pneumonie, Eilenburg, 1852, S. 288-91	301	19	6.3
Kocher, Pneumonie, u. s. w., Würzb., 1866	60	5	8.3
Kreider, N. Y. Med. Rec., Sept. 7, 1889, p. 260	6	2	33.3
Krügerhausen, Praktische Fragmenten, Coblenz, 1845	71	1	1.4
Kühn, Berliner k. Wochenschr., 1879, No. 37	58	8	13.8
Lacage, Ranking's Abst., No. 28, p. 92	42	1	2.5
Laennec, Diseases of the Chest, N. Y., 1830	94	18	19.1

OBSERVER AND REFERENCE.	Cases.	Deaths	Per Cent
Laennec (A.), Jour. soc. méd. la Loire, 1825	40	6	15.0
Laveran, Mal. des. armées, Paris, 1875, p. 28	235	46	19.5
Lesczinsky, quoted by Ziemssen, Pneumonie, 1862, S. 236	245	25	10.0
Leudet, Bull. gén. de therap., 1863	40	3	7.5
Loomis, N. Y. Med. Gaz., April 30, 1881, p. 154	255	87	34.0
Louis, Rech. sur la effets de la saignée, Paris, 1835	78	28	32.2
Louis, on Phthisis, Boston, 1840, p. 440	75	18	24.0
MacGregor, Med. Notes on the Crimean War	4,027	287	7.0
Markham, Gulstonian Lectures, London, 1866	392	56	14.3
Mason, Conn. Bd. Health Rpt., 1885, p. 338	50	23	46.0
McManus, N. Y. Med. Rec., Sept. 8, 1888, p. 260	62	2	3.3
Mercier, Bull. de la soc. l'Anat., T. xii, p. 279	70	29	40.1
Mitchell, Edinb. Med. and Surg. Jour., Nov., 1857	5,909	1,441	24.4
Mitchell, Ibid., p. 404	240	40	16.6
Montreal Gen. Hosp., Osler, Univ. Med. Mag., Nov., 1888	1,012	207	20.4
Morehead, Ranking's Abst., No. 28, p. 92	164	43	26.7
Morris, London Lancet, N. Y., 1881, Vol. I, p. 519	35	11	31.4
Mueller, Ranking's Abst., No. 28, p. 92	10	0	0.0
Neumann, Berliner k. Wochenschr., 1888, S. 119	7	2	28.6
New Orleans Hosp., Osler, Op. cit	3,969	1,508	38.0
Oppolzer, Ranking's Abst., No. 28, p. 92	32	5	15.6
Osler, Edinb. Inf. cases, Op. cit	1,716	306	17.8
Paton, Am. Jour. Med. Sci., Oct., 1870, p. 375	96	2	2.2
Patton, Jour. Am. Med. Assoc., Oct. 16, 1886	63	36	57.1
Pause, Lungenentzündung, Leipzig, 1861, S. 154	169	26	15.3
Peacock, St. Thomas' Hosp. Rpts., Vol. V, p. 18	100	12	12.0
Peaslee, Chicago Med. Standard, Oct., 1889, p. 126	29	3	10.0
Pelletan, Mem. de l'Acad. de méd., T. VIII, p. 373	75	11	14.6
Pendlebury Hosp. Repts., Manchester, 1881-86	234	3	1.3
Penna. Hosp., Osler, Op. cit	704	205	29.1
Pepper, Bost. Med. and Surg. Jour., April 24, 1890	1,485	173	11.6
Piorry, Ranking's Abst., No. 28, p. 92	30	2	6.6
Pr. Edward's Is., 1889, N. Y. Med. Rec., July 13, '89, p. 44	546	40	7.3
Prus, Mem. de l'Acad. de méd., 1840, T. VIII, p. 13	129	77	59.0
Rall, Inaug. Dissert., Stuttg., 1887, S. 5	35	7	20.0
Rasori, Arch. gén. de méd., 1824	832	173	22.0
Reuf, Ranking's Abst., No. 28, p. 92	94	5	5.0
Reyburn, Am. Jour. Med. Sci., April, 1866, p. 368	202	14	6.9
Rietz, Inaug. Dissert., Jena., 1868, S. 19	392	50	12.8
Rilliet et Barthez, Mal. des enfants, Paris, 1838	81	77	95.0
Robinson, London Lancet, N. Y., 1852, Vol. II, p. 288	32	0	0.0
Rodman, N. Y. Med. Rec., 1875, No. 227	98	6	5.9
Rodman, Am. Jour. Med. Sci., Jan., 1876	98	25	25.0
Roth, Statistik d. Pneumonie, Würzb., 1860	237	45	18.9
Routh, London Lancet, N. Y., 1855, Vol. II, p. 36	193	9	4.5
Salawa, Schmidt's Jahrb., 1855, Bd. LXXXVI, S. 30	15	0	0.0
Salem Hosp. Repts., 1877, p. 8	2	1	50.0
Sampson, London Lancet, N. Y., 1851, Vol. II, p. 36	909	209	23.0
Samter, Inaug. Dissert., Breslau, 1881	331	39	11.0
Schapiira, Inaug. Dissert., Würzb., 1877	258	36	14.0
Scheef, Inaug. Dissert., Tübingen, 1882, S. 15	547	72	13.1
Schlesinger, Inaug. Dissert., Berlin, 1873, S. 23, 24	333	51	15.3
Schmidt, Ranking's Abst., No. 28, p. 92	152	20	13.0
Schmidtman, Hufeland's Jour., Bd. III, S. 441	68	2	8.0
Schroeder, Inaug. Dissert., Kiel, 1882	1,277	183	14.3
Schultz, Jour. Am. Med. Assoc., July 30, 1886	238	16	6.5
Scotter, Lancet, 1890, Vol. II, p. 1170	29	18	62.1
Sigmund, Ranking's Abst., No. 28, p. 92	743	104	14.0
Skoda, Allgem. Wiener med. Zeitung, 1863	555	74	13.3

OBSERVER AND REFERENCE.	Cases.	Deaths	Per Cent
Smith, Schmidt's Jahrb., Bd. CXXXII, S. 321	103	3	2.7
Speck, Inaug. Dissert., Marb., 1870, S. 2	50	12	24.4
Stecher, Inaug. Dissert., Leipzig, 1866, S. 14	656	128	19.5
Steffan, Klinik d. Kinderk., Berlin, 1865	94	13	13.8
Steinmetz, Ohio Med. Recorder, June, 1877, p. 34	83	24	29.0
Stephan, Neder. Weekblad, 1888	25	9	36.0
Stortz, Inaug. Dissert., Würzb., 1884	1,432	258	18.5
Stevens, Am. Jour. Med. Sci., Oct., 1870, p. 376	78	5	6.5
Stierlin, Berliner k. Wochenschr., 1870, No. 26	150	7	4.6
Stiertin, Ranking's Abst., No. 28, p. 92	150	7	4.6
St. Mary's Hosp., Quincy, Rept., 1876	4	1	25.0
St. Michael's Hosp., Newark, Rept., 1876	29	4	13.0
Stoahml, Ranking's Abst., No. 28, p. 92	30	0	0.0
Stockholm Mil. Hosp., Huss, Op. cit., S. 86	670	49	7.3
Strong, N. Y. Med. Rec., March 16, 1889, p. 291	20	1	5.0
Sturges, Pneumonia, London, 1876	452	35	7.7
Thiele, Deutsche Klinik, 1855	6	0	0.0
Thielemann, Ranking's Abst., No. 28, p. 92	110	12	11.0
Thomas, Am. Jour. Med. Sci., Oct., 1870, p. 376	106	3	3.0
Thomas, Arch. d. Heilk., Bd. IV, Heft. 2	65	14	21.5
Thomas, Richmond and Louisville Med. Jour., 1876	68	1	1.9
Tommasini, Delle Peripneumonie, Bologna, 1817	115	14	12.1
Townsend, Jour. Am. Med. Assoc., Dec. 1, 1888, p. 789	42	2	5.0
Townsend and Coolidge, Med. News, July, 1889	1,000	250	25.0
Tregagno Epidemic, Deutsch med. Zeit., 1883, Nr. 41	100	30	30.0
Trousseau, Ranking's Abst., Nr. 28, p. 92	52	2	4.0
U. S. Army, 1840-59, Hartshorn, Op. cit.	2,073	224	10.8
U. S. Army, Rebellion, Med. Hist., Vol. I, Pt. 1	77,335	20,116	26.1
U. S. Army, 1870-74, Circular No. 8	791	110	14.0
U. S. Army, 1888, Rept., p. 88	99	26	26.0
U. S. Marine Hosp. Service, 15 years, Repts.	3,511	598	17.0
U. S. Naval Repts., 1879-81-82-88	171	11	6.4
Valleix et Vernois, Quoted by Buchut, Dis. Chil., p. 325	128	127	99.2
Varrentrap, Henle's u. Pfeiffer's Zeitschr., 1851	23	1	4.0
Vienna Gen. Hosp., Ranking's Abst., No. 28, p. 92	6,798	1,966	29.0
Vienna Gen. Hosp., Juergensen, Ziemssen's Handb.	7,942	1,946	24.7
Voght, Bull. gén. de therap., Jan., 1860	56	4	7.0
Vogt, Quoted by Kocher, Op. cit., S. 28	51	4	7.8
Wagner, Contrastimulus, u. s. w., Berlin, 1819	13	7	53.8
Waller, Inaug. Dissert., Erlangen, 1877, S. 25	81	9	11.1
Wassider, Ranking's Abst., No. 28, p. 92	112	4	3.5
Waters, Liverpool and Manchester Repts., Vol. IV	59	2	3.4
Waters, Diseases of the Lungs, p. 87	44	1	2.4
Witherspoon, Am. Jour. Med. Sci., Oct., 1870, p. 376	72	2	3.0
Witte, Inaug. Dissert., Berlin, 1877, S. 41	505	25	5.0
Wittich, Ranking's Abst., No. 28, p. 92	23	0	0.0
Woman's Hosp., Phila., Rept., 1876, p. 12	4	0	0.0
Woodson, Am. Prac., Mar., 1870, p. 289	20	2	10.0
Woodward, U. S. Marine Hosp. Repts., 1890, p. 155	13	2	15.0
Wucherer, Ranking's Abst., No. 28, p. 92	90	1	1.1
Wunderlich, Arch. f. p. Heilk., Bd. III, 1856	237	25	10.5
Wunderlich, Inaug. Dissert., Tüb., 1858, S. 31	50	8	16.0
Zeigeli, Satterthwaite, Med. News, Jan. 5, 1889	40	0	0.0
Author	498	81	16.4
Totals and average ³¹	223,730	40,276	18.1

Several fallacies are liable to creep into a table of this kind. One of these is the fact that some observers count, whilst others do not, those cases of pneumonic inflammation occurring in the course of other grave disorders, *e. g.*, diabetes, chronic nephritis, cerebral disease, cancer, typhoid fever, etc. It is clear that if such cases are included in the calculation, the death-rate will be higher than when primary cases are alone considered. Again, many observers report a series of cases to illustrate the advantages of some favorite method of treatment. In this instance the reporter is prejudiced, and is prone to omit³² from his list as many of the cases as can possibly be eliminated, in order that his percentage of cures may be raised.

There are certain antecedent and surrounding circumstances which influence favorably, or the reverse, the termination of the disease; *e. g.*, age, sex, constitution, temperament, idiosyncrasies, previous health, habits, etc., of the patient, and these must all be considered in forming a prognostic opinion.

Age exercises a remarkable influence over the fatality of pneumonic fever. Patients between the ages of 10 and 40 years withstand the malady better than do those older or younger, and the nearer we approach the extremes of life, the greater the mortality.³³ The death-rate in patients over 60 years of age is, according to some careful observers, as high as 80 per cent., and in the very young it is nearly as great. In the case of infantile pneumonic fever, there is a difference of opinion as to its fatality.

Thus, Trousseau³⁴ is said to have never lost a genuine case in a child. Sturges³⁵ says that "the old are likely to die, the young to recover." D'Espine³⁶ says that the danger in infants is very slight. Ziemssen³⁷ lost only 7 of 201—3.3 per cent.—infantile cases. Jurgensen³⁸ lost 4 of 171 cases in children under 10 years of age—a death-rate of only 2.3 per cent. Baginsky³⁹ considered the danger slight. Vogel⁴⁰ says

that in very young children the death-rate is considerable, but "children over 2 years of age bear lobar pneumonia as well as adults." Steffen⁴¹ reports a mortality of 13.8 per cent. in children, and Funck⁴² places it at 10.3 per cent. Barthez⁴³ had but 2 deaths in 212 cases between the ages of 2 and 15 years—a mortality of 1.9 per cent. Gerhard⁴⁴ lost only one of 40 patients ranging in age from 6 to 16 years. Lebert⁴⁵ regards the danger very slight in patients aged from 5 to 30 years. Fox⁴⁶ says that "childhood is a doubtful cause of death." Stortz⁴⁷ and Schroeder⁴⁸ say that the danger is less in children than in adults, and this opinion is shared by Schapira,⁴⁹ Franque⁵⁰ and others.⁵¹ My own infantile cases have died in less numbers than in the case of adults.

The percentage of deaths at various ages⁵² is shown in the following table:

TABLE II.—SHOWING DEATH RATE OF PNEUMONIC FEVER AT VARIOUS AGES—PER CENT.

AUTHORITY.	—10	10-20	20-30	30-40	40-50	50-60	60-70	70+
Bamberger ⁵³	..	4.0	3.2	5.2	7.0	35.0	40.0	50.0
Blach ⁵⁴	..	9.4	13.3	23.3	31.6	37.8	54.0	56.6
Chomel ⁵⁵	..	..	13.6	18.0	33.3	40.0	63.0	..
Derpmann ⁵⁶	26.3	49.2	48.9	38.9	48.1	40.6	11.5	21.2
Doubleday ⁵⁷	..	21.5	33.3	53.3	70.7	66.6	56.2	50.0
Franque ⁵⁸	..	3.1	10.9	23.5	33.3	76.9	..	..
Huss ⁵⁹	11.1	7.8	7.9	15.1	23.7	26.9	38.9	60.0
Juergensen ⁶⁰	3.0	..	4.0	6.0	10.0	12.0	16.0	11.0
Klinger ⁶¹	43.4	2.2	4.3	5.0	7.3	12.2	17.8	10.7
Lépine ⁶²	..	..	14.0	20.0	25.0	30.0	30.0	80.0
Pause ⁶³	26.5	..	..	17.2	10.5	11.1	35.7	38.4
Roth ⁶⁴	..	4.0	7.6	20.9	26.7	32.3	26.7	60.0
Schapira ⁶⁵	..	1.4	2.8	11.4	21.7	24.0	50.0	75.0
Stechert ⁶⁶	46.1	6.8	7.2	21.1	40.7	52.0	66.6	66.6
Stortz ⁶⁷	..	2.4	6.0	10.5	26.8	33.3	50.0	50.0
Swett ⁶⁸	..	..	24.4	14.3	16.6	20.0	25.0	..
Townsend and Coolidge ⁶⁹	10.0	10.6	18.5	25.3	29.2	55.0	46.9	66.7
Author ⁷⁰	8.0	3.1	7.0	9.4	13.0	24.0	37.0	53.0

Soldiers, on account of their age and surroundings, and from coming early under careful treatment and nursing, present but a light death-rate.⁷¹

In the German army during the years of peace—1868 to 1878, excepting the years 1870-71—there were

42,476 cases of pneumonic fever, with 1,524 deaths, a rate of only 3.6 per cent. During the twenty-six years from 1854 to 1879, there were at the Germersheim garrison 396 cases of this disease, 24 proving fatal, a rate of 6.6 per cent. In the Stockholm military hospital during the four years 1842-45, there were 670 cases of this malady, with 49 deaths, a rate of 7.3 per cent.⁷²

Pneumonic fever is much more fatal in ordinary hospital than in private practice.⁷³ This is due, in a measure, to the fact that such cases usually come late under treatment, and the patients are of a class which bears up illy under severe illness. The jolting to which they are often subjected, in being transported to the hospital, is also very injurious.⁷⁴

Pneumonic fever is more dangerous in the female than in the male,⁷⁵ and this in the face of the fact that the normal death-rate for males is slightly in excess of that for females in diseases of all kinds.⁷⁶

TABLE III.—SHOWING COMPARATIVE MORTALITY OF PNEUMONIC FEVER BY SEXES.

OBSERVER.	MALES.			FEMALES.			TOTAL.		
	Cases.	Deaths.	%	Cases.	Deaths.	%	Cases.	Deaths.	%
Berlin Charite ⁸⁴	453	90	20.0	114	26	23.0	567	116	20.5
Biach ⁸⁵	8,247	1,707	20.7	3,195	959	30.0	11,442	2,666	24.2
Chomel ⁸⁶	313	38	12.5	70	22	32.0	383	60	15.6
Dietl ⁸⁷	364	28	6.7	297	41	12.1	661	69	10.4
Huss ⁸⁸	2,259	291	12.9	451	84	18.6	2,710	375	13.8
Huss, ⁸⁹ Vienna Cases . . .	3,981	831	20.9	2,009	610	30.4	5,990	1,441	24.5
Juergensen ⁹⁰	5,467	1,149	21.0	2,475	795	31.1	7,942	1,944	24.9
Louis ⁹¹	52	15	29.0	23	3	13.3	75	18	24.0
Munich Hospt ⁹²	794	132	16.6	352	81	23.0	1,146	213	18.5
Pause ⁹³	86	14	16.2	83	12	14.4	169	26	15.3
Stecher ⁹⁴	548	95	17.3	108	33	30.6	656	128	19.5
Stortz ⁹⁵	199	23	10.6	87	22	25.3	286	45	25.7
Townsend & Coolidge ⁹⁶ . .	721	182	25.0	276	68	25.0	1,000	250	25.0
Waller ⁹⁷	71	7	10.0	10	2	20.0	81	9	11.1
Author	295	41	14.3	203	40	19.7	498	81	16.4
Totals and averages	23,853	4,643	19.4	9,753	2,798	28.7	33,606	7,441	22.1

Franque⁷⁷ found the death-rate in 1,796 cases of pneumonic fever, 17 per cent. for males and 23 per

cent. for females. Lebert⁷⁸ found the rate 16 and 21.8 per cent. respectively. In the Munich General Hospital the rate is 16.6 and 23 per cent. respectively.⁷⁹ In the three large hospitals of Vienna, the death-rate in 8,247 male cases was 20.7 per cent., and in 3,195 female cases 30 per cent.⁸⁰ Bamberger⁸¹ found the rate in males 8.7, and in females 16.6 per cent. Roth⁸² found it 16.2 and 23.6 per cent. respectively.⁸³

It has been supposed that this extraordinary fatality of pneumonic fever in the female is largely confined to the menstrual and childbearing periods of life,⁹⁸ but the statistics of Klinger,⁹⁹ Stortz,¹⁰⁰ and of my own cases, render this improbable.

The occurrence of menstruation during an attack of pneumonic fever has had usually, in my experience, a beneficial influence.¹⁰¹ Under such circumstances the fever often declines, the nervous excitement is lessened, and there is a distinct amelioration of all the symptoms.

According to Chomel,¹⁰² menstruation increases the danger, whilst Grisolle¹⁰³ says that it increases the severity, but not the mortality of the disease.¹⁰⁴

Pregnant females, according to Greene¹⁰⁵ and others, are necessarily in greater danger than those who are not in this condition, from the fact that there is added to the dangers of the disease those of abortion or premature delivery,¹⁰⁶ which occurs in a considerable proportion of cases.

Chomel¹⁰⁷ considers pneumonic fever in pregnant females as usually fatal; the danger being due to the impediment to respiration and the frequent occurrence of abortion. Of 39 cases analyzed by Chatelain,¹⁰⁸ abortion or premature delivery occurred in 19, and of these 19, 10 died, and of the 39, 20 died. Of 43 cases analyzed by Juergensen,¹⁰⁹ 25 aborted, and of these 7 died.¹¹⁰ Of my 11 cases, 4 aborted and one died.¹¹¹

Post-mortem parturition may occur, as in the case observed by Post,¹¹² in which a woman seven months

pregnant died in the St. Louis Female Hospital in 1872, of pneumonic fever. There were no symptoms of labor before death, but shortly afterwards it was discovered that a living child had been born, which soon died.¹¹³

Pneumonic fever occurring during the puerperium is also extremely dangerous.¹¹⁴

Inasmuch as the different races of mankind have various physical and mental peculiarities, it is a fair inference that they will be differently affected by disease, and observation has abundantly confirmed the supposition in this disease. Pneumonic fever is very much more dangerous in the negro than in the Caucasian race.¹¹⁵

In estimating the mortality of any disease as it manifests itself in the negro of North America, it must be borne in mind that he has an inherent antipathy to consulting a physician. If he is indisposed, or even seriously ill, he either disregards his complaint, or makes use of the domestic remedies suggested by some aged negress, thus remaining for days in the most unsuitable surroundings, without any medical treatment, at a time when proper measures might be of much avail—until the malady has proceeded beyond the bounds of assistance.

It is a general impression with writers, that the strong, the robust and the generally healthy withstand attacks of pneumonic fever better than those of slighter build,¹¹⁶ the cachectic and the sickly. This may be true in the experience of others, but it certainly does not accord with my own observation, and I have for many years looked upon cases of the disease occurring in the robust specimens of manly vigor with suspicion.

Irregular modes of living and habits of drunkenness¹¹⁷ add greatly to the inherent danger of the malady.¹¹⁸

Huss¹¹⁹ lost 20 per cent., and Fisser¹²⁰ 50 per cent., of alcoholic cases, and Greene¹²¹ estimates the death-

rate of such at from 25 to 50 per cent. I am inclined to think that, in confirmed drunkards, it exceeds even these figures.

The victim of chronic alcoholism is in such a state of physical and mental weakness as to be illy able to withstand the onslaught of any disease, and especially one of the gravity of pneumonic fever. He is usually a man having the appearance of robust health, but a careful scrutiny will reveal this to be a delusion and a snare. His bloated and rubicund visage, his ponderous abdomen and his full but soft fleshy parts are no more the indication of strength and vigor than is the padding of a Punch and Judy character. His digestive apparatus is in a state of chronic irritation, and it has for so long a time been accustomed to excessive stimulation that it no longer responds to ordinary irritation, and in the case of disease refuses longer to receive food or even the fiery draughts which have been the patient's ruin. The nervous system also weakens remarkably.

When pneumonic fever attacks such a person it is prone to pursue a latent and insidious course. The initial chill is either absent or but slightly marked. The patient has, for several days, lost his appetite and cannot retain upon his stomach his accustomed ration of alcoholic liquors. He is nervous by day and restless by night. He feels tired and languid, and no longer seeks his companions at his accustomed haunts, but prefers to remain at home, and yet is afraid to be alone. With the access of the disease he is at once and completely prostrated. He may have a cough, with expectoration and some uneasiness referable to the chest. The cough, if present, often escapes notice from the fact that these old toppers have an habitual cough and hawking. If the lungs be now examined, the ordinary physical signs of pneumonic inflammation will be found. Delirium tremens is of very frequent occurrence, and the patient, obtaining no sleep, together with the constant

action, absence of nutrition and the ravages of the disease, soon falls into a state of profound depression and usually dies.

The seat, extent and degree of the local inflammation will greatly modify the prognosis.¹²² It is generally considered more dangerous when the upper lobes are affected¹²³ than when the lesion is basic, although this view does not accord with my experience or the opinion of a few others.¹²⁴

Ruehle¹²⁵ is of the opinion that when the apex is affected, the fever continues longer, resolution is delayed and recovery is not so perfect as when the base is inflamed.

Auenbrugger¹²⁶ considered the danger enhanced when the local lesion was on the left, and Chomel¹²⁷ when on the right side. In my cases the fatality has been greatest when the right lung was inflamed, but I am inclined to attribute the result to the fact that the average extent of pulmonary involvement was greatest in the right sided cases.¹²⁸ The more extensive the local involvement, especially when both lungs are affected, the greater the danger.¹²⁹

Schuyler¹³⁰ says that "inasmuch as the more extensive consolidations generally occur in robust subjects, who, as a rule, recover, and the less extensive and less perfectly formed processes more generally occur in depraved subjects in whom fatality is, as a rule, more frequent, therefore a greater extent of local process may be held as indicating a more tonic and resisting state of the patient, and a better prognosis, while a lesser extension may denote a more asthenic constitutional state, and hence a worse prognosis."¹³¹

The spreading and wandering forms of the disease are very fatal.¹³² The occurrence of gangrene, abscess, general suppuration, etc., greatly increase the danger.¹³³

The duration of the disease has an important bearing upon the prognosis, and "it is often a question of

the intensity of the disease on the one hand and the resisting powers of the individual on the other."¹³⁴ If improvement does not occur at about the time convalescence usually begins the prognosis is rendered grave.

Epidemics of pneumonic fever vary greatly in their fatality; in some scarcely any die and in others almost every patient is doomed. The epidemic prevalence of other diseases, *e. g.*, typhoid, typhus¹³⁵ or cerebro-spinal¹³⁶ fever, etc., increases the severity and danger of pneumonic fever.

Complications of all kinds add to the fatality of the disease.¹³⁷ The great variety of these, together with their nature, seat, tendencies and surrounding influences renders an intelligent analysis of the increased dangers impracticable. It may be said that, as a rule, all anomalous features are of evil import. The subsequent attacks are attended by less danger than are the primary.¹³⁸

The death-rate of pneumonic fever varies from year to year,¹³⁹ and month to month, the variations being due to accidental influences¹⁴⁰ which either elude observation or defy analysis.

Briquet,¹⁴¹ Fox¹⁴² and others¹⁴³ consider pneumonic fever more fatal during the cold than the warm months, but Grisolle¹⁴⁴ objects to this conclusion and it is not in accordance with my experience.¹⁴⁵

In fatal cases death may occur in a variety of ways. In some rare cases the patient is overwhelmed by the onset of the disease and dies in a few hours from extensive pulmonary congestion, with or without profound cerebral symptoms. In another small proportion of cases the morbid processes are carried a step beyond this. The fever rises rapidly to a high point, there is great respiratory oppression, and after perhaps but twenty-four or thirty-six hours convulsions, delirium or coma ends the scene. In these cases the mind of the beholder is appalled by the suddenness with which life was extinguished.

At a later period, also, death may come on very swiftly, sometimes like a flash, from heart clot or cardiac paralysis. In general, however, when death occurs after the first days of illness, the end is approached very gradually and with ample warning.¹⁴⁶ The temperature remains high, cyanosis appears and gradually deepens; the respiratory oppression is increased, and breathing becomes more and more difficult and, finally, more and more shallow; the pulse beats with great rapidity and becomes smaller, weaker, and irregular; the nose, then the hands and lastly the feet, ear and tongue become cold and the surface of the body is covered with a cold and clammy perspiration; the senses are usually benumbed¹⁴⁷ and there is muscular paresis, and often slight tremor; the cough becomes less frequent and weaker and finally ceases altogether; the lower jaw is relaxed; the tongue, mouth and pharynx becomes dry and deglutition becomes difficult and finally impossible; the secretions are not removed from the air passages and a loud and ominous tracheal rattle startles and appalls the listener¹⁴⁸; the respirations grow weaker and weaker, and with pauses of longer and longer duration, until at last they cease and life is a thing of the past.

It has long been supposed, erroneously, I think, that death, when it occurs, is likely to come at the end of a septenary period. Thus Delafield¹⁴⁹ in an analysis of 123 fatal cases found that the largest number died on the seventh day; the next largest on the fourteenth day; the next largest on the twenty-first day, and the next largest on the twenty-eighth day. These remarkable coincidences probably could not be duplicated in any other series of cases.¹⁵⁰

No series of observations sufficiently extensive have been made as to the hour when death oftenest occurs; but of between 5,000 and 6,000 deaths from all causes Haviland¹⁵¹ found the greatest number to have occurred between 1 and 8 o'clock A.M., and the least between

1 and 12 o'clock P.M., whilst Burns¹⁵² in analyzing 15,000 deaths came to the conclusion that death occurs irrespective of hours.

Instances of sudden death during the progress of this disease are of comparatively frequent occurrence and must have been met with by almost every general practitioner of much experience.¹⁵³ Cases of this description, caused by heart-clot, paralysis of the heart and apoplexy are readily explainable, but there remains a certain proportion of cases in which no gross anatomical lesion can be found to explain the untoward result, and which must, with our present knowledge, remain with the occult mysteries of nature.

A man aged 60, apparently in his usual health, went from camp to the city (three miles by train) one morning. At noon he was taken suddenly and violently ill at the house of a friend, and within two hours was sent to the City Hospital. The attending physician reported that he was received unconscious, cold extremities, rapid breathing, temperature 103, and almost moribund. He died within six hours of the attack. Autopsy revealed: lower right lobe passing into a stage of gray hepatization, . . . remainder of lungs deeply engorged.¹⁵⁴

An intelligent man, aged 78, was the subject of chronic genito-urinary disease. He complained of colic at 5 P.M., and was given an enema. He continued restless until midnight when he called for the commode, arose, sank back into the bed and expired. The autopsy revealed inflammation of the base of the right lung.¹⁵⁵

A large and well nourished man, aged 76, felt unwell for several days but was walking about, with a temperature of 99.5°; nothing wrong was discovered with the lungs upon examination. Next morning he was restless, had a temperature 100°, pulse 105, feeble, and respirations 28. Distress in epigastrium; no cough, but there was dullness over the lower two-

thirds of the right lung, with very little air entering the part. An hour later he raised up, called the nurse and expired. The autopsy disclosed inflammation of nearly the whole of the right lung.¹⁵⁶

A female, suffering from pneumonic fever, locally affecting the middle lobe of the right lung, was so little ill on the third day that she persisted in getting out of bed. This she did, dressed, walked across the room and fell dead.¹⁵⁷

A man, aged 28, was "admitted with pneumonia of the lower lobe of the left lung. The attack was a slight one, and the patient improved rapidly. On the morning of the 16th day, as he returned from the bath room, he staggered and fell. He was picked up and put to bed, when he expired almost instantly." The autopsy showed the lower lobe of the left lung in a state of gray hepatization. Both lungs were œdematous.¹⁵⁸

As shown in the last case, sudden death in pneumonic fever is not confined to the acute stages of the disease, but it may occur long after apparent convalescence has set in, and this too, irrespective of the character and severity of the attack.

In the autumn of 1875, I attended a little girl of 8 years, with a mild attack of pneumonic fever, the local lesion being confined to the base of the right lung. The disease pursued an ordinary, but mild course and defervescence by crisis occurred on the fifth day. For a week she remained tired and weak, but improved daily. Her cough had almost ceased, there was no dyspnœa and her appetite was good. One morning, exactly a week after the crisis, her mother came to her bedside, requested her to arise and asked what she desired for breakfast. The child not appearing at the table, the mother ten or fifteen minutes later returned to the bed chamber to find her child dead. It was supposed that she had attempted to arise and had instantly expired.¹⁵⁹

A certain proportion of persons have hearts of very little stability and a trifling impediment to the heart's action may cause sudden alarming or fatal symptoms. It is this contingent which furnishes the majority of sudden deaths in pneumonic fever.

In estimating the chances of recovery in this disease the local lesions, general symptoms and the prevailing morbid influence should all be carefully considered. The omission of this cardinal principle by the medical attendant may be the cause of lamentable errors. A prognosis based upon general impressions is valuable, but a careful consideration of all the surrounding circumstances should not be neglected. In formulating an opinion individuality must always play an important part, as the prognosis in any individual case will vary from the average from an infinity of circumstances.

For this reason numerical calculations must always occupy a secondary place in estimating the fatality of this malady when an individual case is concerned. In this field there must be considered a multitudinous array of circumstances which cannot possibly be considered by the numerical method of calculating chances. Individual cases can only be estimated separately. If, however, we desire to estimate the average probable death rate we may safely invoke the aid of the doctrine of numerical chances, provided, always, that in making the calculation we employ practically infinite numbers.

163 State Street.

1 Restorative Treatment of Pneumonia, p. 45.

2 See Cincinnati Lancet and Observer, November, 1862, p. 668.

3 Rev. med. de Toulouse, July, 1879.

4 Physician and Surgeon, April, 1876, p. 161.

5 Am. Jour. Med. Sci., October, 1870, p. 375.

6 Richmond and Louisville Med. Jour., April, 1876.

7 Pleuritis u. Pneumonie, Berlin, 1862, S. 256.

8 London Practitioner, Vol. xxxi, p. 39.

9 Clinical Medicine, Phila., 1873, Vol. i, p. 663.

10 Pneumonie u. Pleuritis, Würzb., 1880, S. 3 und 66.

11 N. Y. Med. Record, July 14, 1877.

12 Contributions to Clinical and Practical Medicine, London, 1887.

13 See Barnett, Jour. Am. Med. Assoc., December 11, 1886, p. 656; Mor

row, *Prac. Med.*, Columbus, 1853, p. 705; Rindfleisch, *Path. Histol.*, Phila., 1872, p. 391; et al.

¹⁴ *N. Y. Med. Record*, September 17, 1887, p. 375.

¹⁵ *Medical News*, April 7, 1888.

¹⁶ *Prac. Medicine*, Phila., 1847, Vol. xi, p. 41.

¹⁷ See Chaumier, *Gaz. des Hôp.*, 1884; Cobleigh, *Phila. Med. World*, April, 1885, p. 132; Donaldson, *N. Y. Med. Jour.*, March 7, 1885, p. 267; Grimshaw, *Dublin Jour. Med. Sci.*, May, 1875; Holt, *N. Y. Med. Record*, February 14, 1885, p. 174; Legendre, *Arch. gen. de med.*, 1859; Rodman, *N. Y. Med. Record*, 1875; Stratton, *Med. Brief*, May, 1886, p. 205; Whittaker, *Cin. Clinic*, June 16, 1877; et al.

¹⁸ *Am. Jour. Med. Sci.*, Vol. xiv, p. 328.

¹⁹ Smith, *Guy's Hosp. Rep.*, Vol. xlii, p. 59; et al.

²⁰ *Med. Dic.*, N. Y., 1855, Vol. xi, p. 892.

²¹ *Dis. Int. Valley N. A.*, Phila., 1854, p. 853.

²² *Medical Sketches*, Dedham, 1815.

²³ See Andral, *Path. Med.*, Paris, 1836, T. 1, p. 386; Cowan, *Trans. Tenn. State Med. Soc.*, 1891, p. 195; Gairdner, *Lancet*, 1887, Vol. ii, p. 247; Golynz, *Trudi Russk. Obsh. ochran. narod-zdravija*, St. Petersburg, 1890, vi, p. 140; Loubimoff, *Protokol. Zased. Kavkazsk. med. Obsh.*, Tiflis, 1889-90, xxvi, p. 444; Patten, *Therap. Gaz.*, April, 1885, p. 234; Robb, *Jour. Am. Med. Assoc.*, November 28, 1885, p. 614; Routh, *London Lancet*, N. Y., 1855, Vol. ii, p. 145; Steinmetz, *Ohio Med. Record*, June, 1877, p. 34; Woodson, *Trans. Tenn. State Med. Soc.*, 1891, p. 193; et al.

²⁴ *Med. News*, June 9, 1883, p. 646.

²⁵ *Pepper's Syst. Med.*, Phila., 1885, Vol. iii.

²⁶ *Lancet*, 1891, Vol. i, p. 647.

²⁷ *Op. cit.*, p. 267.

²⁸ *Jour. Am. Med. Assoc.*, October, 1885.

²⁹ *Natural History of Pneumonia*, London, 1876, p. 203.

³⁰ *Op. cit.*

³¹ Smith, *N. Y. Med. Rec.*, October 20, 1888, p. 469; Woodson, *op. cit.*, p. 193; et al.

³² No attempt has been made to render this table complete.

³³ See also Gairdner, *Dublin Med. Press*, February 28, 1855.

³⁴ See also Aitken, *Sci. and Prac. Med.*, Vol. ii, p. 74; Bamberger, *Wiener Med. Wochenschr.*, 1857, Nr. 50 u. 51; Biach, *Med. Jahrb.*, Wien., 1879; Chomel, *Pneumonie*, Leipzig, 1841, S. 304; D'Espine, *Ann. d'hyg. et de med.*, 1840, T. xxiii, p. 50; Doubleday, *N. Y. Med. Rec.*, March 28, 1885, p. 343; Forseheimer, *Cincinnati Lan. and Clinic*, January 28, 1882; Fox, *Op. cit.*, p. 205; Franque, *Statistik d. Pneumonie*, Würzb., 1855; Grisolle, *Traite de la pneumonie*, Paris, 1864; Hourmann et Dechambre, *Arch. gen. de med.*, T. xii, p. 28; Huss, *Op. cit.*, S. 94; Juergensen, *Ziemssen's Handb.*, Bd. v; Lebert, *Berliner k. Wochenschr.*, September 4, 1871; Lees, *Lancet*, 1889, Vol. ii, p. 890; Lepine, *Pneumonie*, Wien., 1883, S. 159; Loomis, *Pepper's Syst. Med.*, Phila., 1885, Vol. iii, p. 195; Niemeyer, *Prac. Med.*, Vol. i, p. 183; Porter, *St. Louis Med. Press*, March 30, 1889, p. 340; Rilliet et Barthez, *Mal de l'enf.*, Paris, 1838; Robb, *Op. cit.*, p. 614; Routh, *Op. cit.*, p. 145; Schapira, *Inaug. Dissert.*, Würzb., 1877; Schroeder, *Inaug. Dissert.*, Kiel., 1882; Smith, *Guy's Hosp. Repts.*, Vol. xlii, p. 59; Speck, *Inaug. Dissert.*, Marb., 1870, S. 4; Sturges, *Op. cit.*, p. 203; Swett, *Dis. Chest*, N. Y., 1856, p. 86; Ziemssen, *Op. cit.*; et al. Schuyler, *N. Y. Med. Jour.*, May 14, 1887, p. 543, says that "age in itself is not a cause of death in acute lobar pneumonia."

³⁵ *Med. Klin.*, übersetz, von Cülmann, Bd. 11, S. 410.

³⁶ *Op. cit.*, p. 203.

³⁷ *Trans. Intern. Med. Cong.*, Washington, 1887.

³⁸ *Pleuritis u. Pneumonie*, Berlin, 1862, S. 256.

³⁹ *Ziemssen's Handb. d. Spec. Path. u. Therap.*, Bd. v, 1877, S. 158.

⁴⁰ *Pneumonie u. Pleuritis*, Würzb., 1880, S. 66.

⁴¹ *Diseases of Children*, Am. Ed., p. 294.

⁴² *Klinik d. Kinderkrankh.*, Berlin, 1865.

⁴³ *Inaug. Dissert.*, Griefsw., 1868.

⁴⁴ *Bull. de l'Acad. de med.*, 1863, T. xxvii, p. 676.

⁴⁵ *Am. Jour. Med. Sci.*, Vol. xiv.

- 45 Berliner k. Wochenschr., September 4, 1871.
 46 Op. cit., p. 209.
 47 Inaug. Dissert., Würzb., 1884, S. 40.
 48 Inaug. Dissert., Kiel, 1882.
 49 Inaug. Dissert., Würzb., 1877, S. 19.
 50 Op. cit., Diss.
 51 Rufz, Jour. de med. et de chir., T. iii, p. 101; et al. Snow, N. Y. Med. Rec., June 15, 1889, p. 652, considers the danger increased by the presence of rickets.
 52 See also Loomis, Prac. Med., N. Y., 1884, p. 95; Schuyler, N. Y. Med. Jour., May 14, 1887, p. 543; et al.
 53 Wiener med. Wochenschr., 1857.
 54 Op. cit.
 55 Pneumonie, Leipzig, 1841, p. 304.
 56 Inaug. Dissert., Bonn, 1885, S. 19.
 57 N. Y. Med. Rec., March 28, 1885, p. 343.
 58 Statistik d. Pneumonie, u. S. W., Würzb., 1855.
 59 Lungenentzündung, Leipzig, 1861, S. 94.
 60 Op. cit.
 61 Bayer, ärztl. Intelligenzbl., 1874, Nr. 35 u. 36.
 62 Pneumonie, Wien., 1883, S. 159.
 63 Lungenentzündung, Leipzig, 1861, S. 154.
 64 Inaug. Dissert., Würzb., 1860.
 65 Inaug. Dissert., Würzb., 1877.
 66 Inaug. Dissert., Leipzig, 1866, S. 14.
 67 Inaug. Dissert., Würzb., 1884, S. 19.
 68 Diseases of the Chest, N. Y., 1856, p. 86.
 69 Trans. Am. Clinical Assoc., 1889.
 70 Medical Progress, February, 1890, p. 637.
 71 See Colin, Etudes clin. de med. mil., Paris, 1863; Hermann, Lungenentzündung, München, 1880, S. 6; et al.
 72 See Huss, Op. cit., S. 87.
 73 See Lebert, Berliner k. Wochenschr., Sept. 4, 1871; et al.
 74 See Wells, Jour. Am. Med. Assoc., Dec. 19, 1885.
 75 Bamberger, Wiener, m. Woch., 1857; Chatelain, Jour. de med. de Brux., 1870; Chomel, Op. cit., S. 305; Fox, Op. cit., p. 205; Franque, Inaug. Dissert., Würzb., 1855; Funck, Inaug. Dissert., Griefsw., 1868; Green, Oubeur, Dic. Med. N. Y. 1884, p. 881; Huss, Op. cit., S. 71; Lebert, Klinik d. Brustk. Tüb., 1873; Lepine, Pneumonie, Wien, 1883, S. 160; Pause, Lungenentzündung, S. 126; Robb, Jour. Am. Med. Assoc., Nov. 28, 1885, p. 614; Routh, Lon. Lancet, N. Y., 1855, Vol. xi, p. 145; Schapira, Inaug. Dissert., Würzb., 1877, S. 16; Stortz, Inaug. Dissert. S. 39; Swett, Dis. Chest, N. Y., 1856, p. 87; Waller, Inaug. Dissert. Erlangen, 1877, S. 25; Walshe, Dis. Lungs, Phila. 1860, p. 214; et al.

76—TABLE I, NOTES.—SHOWING DEATH RATE FROM ALL CAUSES BY SEXES IN MASSACHUSETTS.

YEAR.	Males Per 1,000.	Females Per 1,000.	Excess of Males over Fe- males per 1,000.
1860	19.3	18.4	.9
1865	21.7	19.6	2.1
1870	19.5	18.6	.9
1875	21.8	20.5	1.3
1880	20.3	19.3	1.0
Averages	20.5	19.3	1.2

77 Op. cit.

78 Klinik d. Brustkrankh., Tüb., 1873.

79 Stortz, Op. cit., S. 7.

- 80 Biach, *Med. Jahrb.*, Wien, 1879.
 81 Wiener med. Wochenschr., 1857.
 82 *Op. cit.*
 83 Klinger, *Lungenkrankh. in Bayern*, 1872, found the deaths in males more numerous than in females.
 84 *Annalen*, 1874-75.
 85 *Med. Jahrb.*, Wien, 1879.
 86 *Lungenentzündung*, S. 305.
 87 *Lungenentzündung*, Wien, 1853, S. 37.
 88 *Lungenentzündung*, S. 91.
 89 *Op. cit.*, S. 91.
 90 *Ziemssen's Handb.*, Bd. V.
 91 *Phthisis*, Boston, 1836, p. 440.
 92 *Berichte*, 1865-75.
 93 *Op. cit.*, S. 154.
 94 *Inaug. Dissert.*, S. 14.
 95 *Inaug. Dissert.*, Würzb., 1884.
 96 *Trans. Am. Climat. Assoc.*, 1889.
 97 *Inaug. Dissert.*, Erlangen, 1877.
 98 See Huss, *Op. cit.*, S. 95.
 99 *Pneumonie in Bayern*, München, 1872.
 100 *Inaug. Dissert.*, Würzb., 1884.
 101 See also Wunderlich, *Spec. Bath. u. Therap.*, Stuttg., 1858.
 102 *Pneumonia*, Leipzig, 1841, S. 306.
 103 *Traite de la pneumonie*, Paris, 1864.
 104 See also Fox, *Reynolds' Syst. Med.*, Phila., 1880, Vol. II, p. 205; Huss, *Lungenentzündung*, Leipzig, 1861; et al.
 105 *Quain's Dic. Med.*, N. Y., 1884, p. 881.
 106 *Chatelein. Jour. de med. de Brux.*, 1870; Fox, *Op. cit.*, p. 205; Guss-crow, *Berliner k. Wochenschr.*, 1880, Nr. 17; Huss, *Op. cit.*; Juergensen, *Ziemssen's Handb.*, Leipzig, 1877, Bd. V, S. 127; Grisolle, *Op. cit.* p. 470; Lepine, *Pneumonie*, Wien, 1883, S. 188; Ringe, *Volkmann's k. Vortrage*, Nr. 174; Robb, *Jour. Am. Med. Assoc.*, Nov. 28, 1885, p. 614; Wells, *Ibid.*, Dec. 19, 1886; et al.
 107 *Op. cit.*, S. 307.
 108 He thinks that during the last three months 50 per cent. die. See *Jour. de med. et de chir. de Brux*, 1870, Juine.
 109 *Op. cit.*, S. 28.
 110 *Op. cit.*, S. 127.
 111 For further information consult Carroll, *Cincin. Lan and Obsr.*, Aug. 1862, p. 475; Da Costa, *Jour. Am. Med. Asso.*, Dec. 17, 1887, p. 791; Fisher, *N. Y. Med. Rec.*, July 28, 1888, p. 93; Folkmann, *Inaug. Dissert.*, Erlanger, 1877, S. 35; Gehrung, *Am. Prac.*, Aug. 1877, p. 74; Harrison, *Jour. Am. Med. Assoc.*, Aug. 13, 1887, p. 210; Heygate, *Lancet*, 1887, Vol. xi, p. 1252; Kemper, *Med. World*, 1888, p. 261; Korotkevich, *Russkaya Med.*; McManus, *N. Y. Med. Rec.*, Sept. 8, 1888, p. 260; Pause, *Lungenentzündung*, Leipzig, 1861, S. 84; Polk, *N. Y. Med. Jour.*, Sept. 15, 1888, p. 284; Rall, *Inaug. Dissert.*, Erlangen, 1887, S. 34; Richardson, *Cin. Lan and Observ.*, Oct. 1862, p. 591; Schapira, *Inaug. Dissert.*, S. 19; Stechert, *Inaug. Dissert.*, Leipzig, 1866, S. 28; et al.
 112 *Jour. Am. Med. Assoc.*, Oct. 29, 1887, p. 566.
 113 *Coles, Ibid.*, p. 566.
 114 *Barnes, Obst. Trans.*, Vol. iv, p. 55; Chomel, *Op. cit.* S. 307; Der-ville, *Pleuro-pneumonie dans la Fievre puerperale*, Paris, 1874; Fox, *Op. cit.* p. 205; Kreider, *N. Y. Med. Rec.*, Sept. 7, 1889, p. 260; Pause, *Op. cit.*, S. 85.
 115 See Armstrong, *U. S. Marine Hospit. Rpts.*, 1886, p. 123; Banjon, *Mal. de Cayenne*, T. 1, p. 73; Cartwright, *N. O. Med. Jour.*, Vol. ix, p. 205; Daniell, *Med. Topog. Guine*, p. 95; Drake, *Dis. Int. Valley N. A.*, Phila., 1854, p. 416; Grier, *N. O. Med. Jour.*, Vol. ix, p. 430; Harris, *Trans. Am. Med. Assoc.*, Vol. v, p. 373; Jackson, *Sketches*, Vol. xi, p. 84; Lewis, *N. O. Med. and Surg. Jour.*, Vol. iv, p. 33; La Roche, *Pneumonia*, Phila., 1854 p. 416; Pendleton, *Southern Med. and Surg. Jour.*, 1849; Robb, *Jour. Am. Med. Assoc.*, Nov. 28, 1885, p. 614; Valleix, *Guide du med. prat.* T. II, p. 259; et al.

- ¹¹⁶ See Fox, *Op. cit.* p. 206; Huss, *Op. cit.*: et al.
¹¹⁷ Has no influence! Owen, *N. Y. Med. Rec.*, Aug. 18, 1888, p. 185.
¹¹⁸ See Copland, *Med. Dic.*, N. Y., 1855, Vol. 1; Drummond, *Lancet*, 1891, Vol. 1, p. 647; Dusol, *Thèse de Paris*, 1876; Fismser, *Arch. f. k. Med.*, Bd. xi, 1873, S. 391; Flint, *Prac. Med.*, Phila., 1868, p. 184; Foramel, *Cin. Lan. and Clinic*, Jan. 15, 1887, p. 86; Fox, *Op. cit.*, p. 207; Gerhard, *Dis. Chest*, Phil., 1860, p. 202; Green, *Quain's Dic. Med.*, p. 881; Huss, *Op. cit.*, S. 139; Lepine, *Op. cit.*, S. 160; Loomis, *Pepper's Syst. Med.*, Phila., 1885, Vol. iii; Peters, *N. Y. Jour. Med.*, Vol. iii, p. 335; Robb, *Op. cit.*, p. 614; Smith, *Guy's Hospit. Rpts.*, Vol. xlv, p. 59; Swett, *Dis. Chest*, N. Y., 1856, p. 87; Sturges, *Pneumonia*, London, 1876, p. 87; Watson, *Prac. Phys.*, Phila., 1845, p. 584; et al.
¹¹⁹ *Op. cit.*, S. 139.
¹²⁰ *Op. cit.*, S. 191.
¹²¹ *Op. cit.*, p. 881.
¹²² Gerhard, *Dis. Chest*, Phila., 1860, p. 211, and Ziemssen, *Pleuritis u. Pneumonie*, Berlin 1862, S. 261, think that the seat and extent of the local affection exert no influence over the course of the disease.
¹²³ Andral, *Med. Clin.*, Phila., 1843, Vol. ii, page 205; Chomel, *Op. cit.*, p. 296; Davis, *N. W. Med. Jour.*, Vol. iii, p. 429; Fox, *Reynold's Syst. Med.*, Phila., 1880, Vol. ii, p. 206; Green, *Quain's Dic. Med.*, N. Y., 1884, p. 880; Krupp, in Chomel's *Pneumonie*, S. 25; Louis, *Roch. sûr effets de la saignée*, p. 42; Robb, *Jour. Am. Med. Assoc.*, Nov. 28, 1885, p. 614; Rilliet et Barthez, *Mal. de la enf.*; Scheel, *Inaug. Dissert.*, Tüb., 1882, S. 26; Schuyler, *N. Y. Med. Jour.*, May 14, 1887, p. 541; Todd, *Brit. Med. Assoc. Jour.*, May 15, 1882, p. 483; Watson, *Prac. Phys.*, Phila., 1845, p. 583; et al.
¹²⁴ *Collective Invest. Rec.*, London, 1884, Vol. ii; Gerhard, *Op. cit.*; Ziemssen, *Op. cit.*, S. 211.
¹²⁵ Ziemssen's *Handb.*, Leipzig, 1877, Bd. V. Heft 2, S. 28.
¹²⁶ *Inventum Novum*, etc., Vien., 1761, sec. xxv.
¹²⁷ *Op. cit.* S. 296. See also Huss, *Lungenentzündung*, 1862.
¹²⁸ In Townsend and Coolidge's *Trans. Am. Climat. Assoc.*, 1889, cases the fatality was, according to the seat of the inflammation, as follows: Right lung, entire, 74 cases, 39 fatal, 53%; right lung, lower lobe, 377 cases, 47 fatal, 14%; right lung, middle lobe, 19 cases, 4 fatal, 22%; right lung, upper, 105 cases, 25 fatal, 24%; Total 575 cases, 115 fatal, 20%. Left lung, entire, 30 cases, 26 fatal, 67%; left lung, lower lobe, 216 cases, 28 fatal, 13%; left lung, upper lobe, 31 cases, 7 fatal, 23%; total 286 cases, 61 fatal, 21.4%. Duplex 111 cases, 63 fatal, 57%.
¹²⁹ Chomel, *Op. cit.*, S. 295; Fox, *Op. cit.*, p. 206; Green, *Op. cit.*, p. 881; Huss, *Op. cit.*, S. 114; Martyn, *London Lancet*, N. Y., 1854, Vol. i, p. 533; Robb, *Op. cit.*, p. 614; Smith, *Guy's Hospit. Rpts.*, Vol. xlv, p. 59; Todd, *Op. cit.*, p. 483; et al.
¹³⁰ *N. Y. Med. Jour.*, May 14, 1887, p. 541.
¹³¹ These premises are opposed to my experience.
¹³² Drummond, *Lancet*, 1891, Vol. 1, p. 647; Fox, *Op. cit.*, p. 206; Green, *Op. cit.*, p. 88; Lépine, *Op. cit.*, S. 18 u. 158; Pause, *Lungenentzündung*, Leipzig, 1861, S. 9; et al.
¹³³ See especially Chomel, *Op. cit.*, S. 297; Huss, *Op. cit.*
¹³⁴ Green, *Op. cit.*, p. 882.
¹³⁵ See Caton, *Lancet*, 1884, Vol. 11., p. 136.
¹³⁶ Ruenberg, *Berliner k. Wochenschr.*, 1888, S. 94; et al.
¹³⁷ See Bennett, *Restorative Treatment Pneumonia*; Besnier, *Thèse de Paris*; Biach, *Op. cit.*; Brandes, *Virchow's Archiv*, bd. xv., S. 210; Doubleday, *N. Y. Med. Rec.*, Mar. 28, 1885, p. 313; Dusol, *Thèse de Paris*, 1876; Flint, *Med. News*, Nov. 28, 1885, p. 605; Glasgow, *St. Louis Cour. of Med.*, Mar. 1886, p. 195; Hartshorn, *Med. News*, Apr. 8, 1888; Huss, *Op. cit.*; Huxham, *Epidem. Dis. London*, 1748, p. 59; Juergensen, *Op. cit.*; Lepine, *Op. cit.*, S. 166; Moore, *N. Y. Med. Rec.*, July 10, 1886, p. 57; Lawrence, *London Lancet*, N. Y., 1853, Vol. 1, p. 73; Hyde, *Med. News*, Nov. 28, 1885, p. 605; Moxon, *Lancet*, 1884, Vol. 1, p. 53; Rilliet et Barthez, *Op. cit.*; Robb, *Op. cit.*, p. 614; Sturges, *Op. cit.*; Swett, p. 87; Van Bibber, *Jour. Am. Med. Assoc.*, July 28, 1888, p. 110; Ziemssen, *Op. cit.*, S. 261.
¹³⁸ See Landsberger, *Inaug. Dissert.*, Berlin, 1887, S. 16; Lepine, *Op. cit.*; Leudet, *Jour. med. del hotel Dieu de Rouen*; Stortz, *Inaug. Dissert.*, Wurzb., 1884, S. 51; et al.

- 139 See Huss, *Op. cit.*, S. 80.
- 140 Glasgow, *Op. cit.*, p. 195.
- 141 Arch. gèn. de med. 1840.
- 142 *Op. cit.*, p. 206.
- 143 See Besnier, *Op. cit.*; Huss, *Op. cit.*; Sestier, Chomel's Pneumonie, Leipzig, 1841; Stortz, *Inaug. Dissert.*, Würzb., 1884.
- 144 *Op. cit.*
- 145 See also Reitz, *Inaug. Dissert.*, Jena., 1868, S. 8.
- 146 The earliest, and, therefore, the most valuable sign of approaching death is an up and down movement of the trachea—anticipating alarming changes in the pulse and temperature. It is due to paresis of the infra-laryngeal nerve, and sounds the first note of alarm that the central nervous system is profoundly and irretrievably affected. See also Shrady, *N. Y. Med. Rec.*, 1875, No. 230.
- 147 There are exceptions to this rule.
- 148 It seems that this is unnoticed by the patient himself.
- 149 *N. Y. Med. Jour.* Vol. xxvii, p. 68.
- 150 See also Cleghorn, *Op. cit.*, S. 243; Dietl, *Op. cit.*, S. 72; Doubleday, *Op. cit.*, p. 343; Green, *Op. cit.*, p. 878; Hermann, *Op. cit.*, S. 22; Pause, *Op. cit.*, S. 155; Rept. Bd. Health, D. C., 1878, p. 113; Stecher, *Op. cit.*, S. 24; Stortz, *Op. cit.*, S. 57; Sturges, *Op. cit.*, p. 272; Swett, *Op. cit.*, p. 85; Townsend and Coolidge, *Op. cit.*; Wunderlich, *Inaug. Dissert.*, Tüb., 1858, S. 25; et al.
- 151 *London Lancet.* N. Y., 1864, Vol. xi, p. 616; See also Berens, *Phil. Med. Times*, Apr. 3, 1875.
- 152 Burns, *N. Y. Med. Jour.*, Jan. 4, 1890, p. 17.
- 153 See also Ashton, *London Lancet*, N. Y., 1855, Vol. 1, p. 260; Green, *Op. cit.*, p. 878; Quain, *London Lancet*, N. Y., 1855, Vol. 1, p. 260.
- 154 Patton, *Jour. Am. Med. Assoc.*, Oct. 16, 1886, p. 427.
- 155 Patton, *Op. cit.*
- 156 Patton, *Op. cit.*
- 157 Ewens, *Lancet*, 1890, Vol xi, p. 662.
- 158 U. S. Marine Hospt. Repts. 1883, p. 242.
- 159 See for other cases Biggs, *N. Y. Med Rec.* July 21, 1888, p. 77; Cruviellier, *Path. Anat. Liv.* xxix; Fox, *Op. cit.* p. 183; Heale, *London Lancet*, N. Y., 1853, Vol. 1, p. 64; Lesser, *Berliner k. Wochenschr.*, 1888, S. 305; Maschka, *Ibid.*, S. 305; et al.

